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ABSTRACT

An instructor's manual and student activity guide on masonry are provided in this set of prevocational education materials which focuses on the vocational area of trade and industry. (This set of materials is one of ninety-two prevocational education sets arranged around a cluster of seven vocational offerings: agriculture, home economics, distributive education, health occupations, world of work, trade and industry, and office occupations.) The instructor's guide is organized into the following elements: title of activity, duration of activity (six to fourteen days), activity goals, instructional objectives (fifteen), related vocational clusters, and activity implementation (description, materials needed, safety considerations, teacher preparation prior to class, during the class, follow-up activities, answer key(s) to instructional objectives 1, 2, 3, and 4, and duplication masters of student question and answer sheets). The student activity guide provides step-by-step instructions (narrative and illustrations) for completing each instructional objective (e.g., identify terms related to masonry, mix practice mortar, lay a course of bricks). At the end of each set of instructions is a student check point (evaluation activity). Occupational descriptions for a bricklayer supervisor, stonemason supervisor, bricklayer, and stonemason conclude the document. (JH)

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T & I – MASONRY

Kit No. 10

INSTRUCTOR'S MANUAL

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Office of Vocational Education
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1978

CE 020 484

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TITLE OF ACTIVITY

Kit No. 10, T & I – Masonry

DURATION

Main Activity: 5 – 7 days
Follow-up Activity: 1 – 7 days

GOALS

The student is allowed to become acquainted with the skills and knowledge of the masonry trade. To become familiar with the trade the student must learn the tools and their uses, and be familiar with certain terms related to the trade known as "the language of the trade."

INSTRUCTIONAL OBJECTIVES

The student will identify the tools and their uses.
The student will use the terms related to masonry.
The student will identify the parts of a trowel.
The student will prepare a work area.
The student will mix practice mortar.
The student will spread a trowel of mortar.
The student will riffle and cut off mortar.
The student will set mortar on a trowel.
The student will butter a brick.
The student will lay a course of brick.
The student will attach a line to a block.
The student will attach two (2) blocks.
The student will lay two (2) courses of brick.
The student will lay three (3) courses of brick.
The student will joint finished wall.

VOCATIONAL CLUSTERS

Related trades are math, and blueprint reading, other vocational trades such as carpentry, electricity, etc. are also related.

ACTIVITY IMPLEMENTATION

A. Description

The purpose of this activity is to allow students to become acquainted with the skills and knowledge of the masonry trade. The students will learn how to make mortar by using hydrated lime and sand for a practice mortar. The students will learn to use the trowel, brickhammer, brick set, and jointer by building a simple 4 in. (10.16 cm) brick wall laid to the line on a workstand. A follow-up project is provided for the student to use his/her skills in building a 12 in. x 12 in. (30.48 cm x 30.48 cm) pier. This will give him/her an opportunity to use the level.

B. Safety

Be careful when mixing mortar. The lime is a very fine powder and could cause a very dusty atmosphere.

C. Materials

1. Audio Visual Equipment:
   None

2. Technical Equipment

   Trowels (13)
   Brickhammers (1)
   Levels (3)
   Jointers (3)
   Lineblocks (13 pairs)
   Mason Line (1 Ball)
   Mortarboards (13)
   Measuring pails (6)
   Brick grabs (1)
   Brick sets (1)
   Spacing rules (1)
   Set of occupational comics (1)

3. Expendable materials:

   Brick (1500)
   Sand (2 tons, 1814.4 kg)
   Hydrated Lime (5 bags)

D. Preparation Prior to Class

Duplicate student worksheets.
Check expendable materials listed.
Set out tools for observation.

E. During Class Sessions

Divide your class in half, Groups A & B. Allow each member of Group A to choose an occupational comic book of his/her choice. Require these students to complete the check sheets at the end of these books on a separate sheet of paper. Group B will be involved with the activity described below. When Group B has completed the activity reverse group positions so students will have gone through both aspects of the activity.

A suggested schedule is:

1st period: Give out student answer sheet for students' use in doing Objectives I-IV. Tools should be laid out for students to handle and become familiar with.

2nd period: The student will use the trowel to mix mortar. This experience will allow the student to use the trowel more easily when he/she begins to lay brick. Have student mix mortar on the mortarboard. Mortarboards should be arranged in straight lines for better observation. The student should practice spreading mortar on the side of his/her mortarboard before trying to spread on the work stand. Store the mortar in the mortarbox at the end of the class period. Practice mortar may be used again by adding more water and mixing thoroughly with the trowel. Have students clean tools and put them in their proper place at the end of the class period.

3rd period: Students should be allowed to practice attaching lineblocks to a mason line. Have students remix their mortar by adding water. Have students practice buttering a head joint on the end of a brick and the side edge of a half-brick. Students should store practice mortar and clean and store tools at the end of each class period.

4th – 7th periods: Have students remix their mortar and practice spreading mortar on the work stand several times before starting to lay brick to the line. The mortarboard should be placed about 2 feet from the work stand, and the brick should be stacked in a neat pile on each side of the mortarboard. Have students attach lineblock to the line and to the work stand before starting to lay brick. Have students tear down their brick wall and store all material in their proper place at the end of the class periods.

The students programmed text should be followed very closely for each activity. If other projects are needed, refer to the follow-up activities.

F. Follow-up Activities

1. Students must do a view fact sheet on mason or bricklayer.
2. Student may build a pier.

ANSWER KEY

OBJECTIVE I

A. Brick Grabs
B. Mortarboard
C. Gallon Pail
D. Workstand

OBJECTIVE II

1. Brickhammer
2. Spacing rule
3. Line blocks
4. Mason's line
5. Brickset
6. Trowel
7. Level
8. Jointer

OBJECTIVE III

1. Shank
2. Point
3. Handle
4. Blade
5. Ferrule

OBJECTIVE IV

1. E
2. K
3. F
4. G
5. A
6. I
7. J
8. C
9. B
10. D
11. H

MASTERS FOR DUPLICATION

1. VIEW Fact Sheet
2. Student Answer Sheet

VIEW FACT SHEET

NAME _____ CLASS _____ OCCUPATION _____

A. List the advantages (good points) of this occupation (job).

B. List the disadvantages (bad points) of this occupation (job).

C. List three things you should know to do this occupation (job).
1.
2.
3.

D. What type of education should you get to be prepared (do) for this occupation (job)?

E. What courses must you take to go into this occupation (job)?

F. What do you think your future in this occupation (job) will be?

G. What wage can you expect in this occupation (job)?

H. What are the working hours of this occupation (job)?

I. To learn more about this occupation (job), write to:

J. Using a scale of 1 to 5, circle the number that measures your interest in this occupation (job) as a possible career.

I don't like it. ← 1 2 3 4 5 → I like it.

MASONRY

STUDENT ANSWER SHEET

INSTRUCTIONAL OBJECTIVE I

A _____

B _____

C _____

D _____

INSTRUCTIONAL OBJECTIVE II

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

INSTRUCTIONAL OBJECTIVE III

1 _____

2 _____

3 _____

4 _____

5 _____

INSTRUCTIONAL OBJECTIVE IV

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____

11 _____

12 _____

T & I – MASONRY

Kit No. 10

STUDENT

LEARNING ACTIVITY GUIDE

Prepared by
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MASONRY

INTRODUCTION

Masonry covers a broad spectrum of building materials, such as brick, block, stone, mortar and cement, and the ability to use them. In most areas a person will work as an apprentice for a period of three to four years before acquiring the necessary skills to become a skilled mason or journey worker. This activity will cover the basic tools, terminology and skills for mixing mortar and laying brick.

History: Stone was probably used many years before brick, but brick is probably the oldest manufactured building material. Excavations made in recent years have uncovered cities estimated to be over 5,000 years old that were built with brick. Some of the early bricks were molded into shape and dried in the sun. Sun dried brick is known as "adobe" brick. Other brick was molded, dried and then subjected to fire.

The first brick making machine in the U.S. was patented in 1800. Brick was made in the North Americas as early as 1612. Brick is used in industrial and residential buildings. Today on your way home from school notice how many buildings are made from brick.

The first activity will be to learn the basic tools and materials used in masonry. Each student should be able to name the individual tools and also learn the purpose of each tool.

Before beginning the actual uses of the tools, each student should know certain terms (the language of the trade) pertaining to brick laying.

GOALS

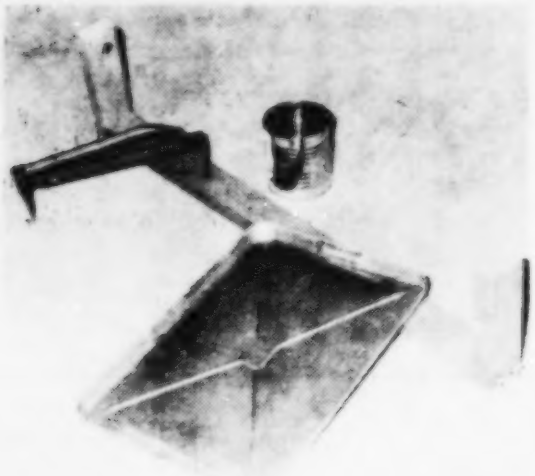
The purpose of this text is to allow students to become acquainted with the skills and knowledge of the masonry trade. To become familiar with the trade the student must learn the tools and their uses, and be familiar with certain terms related to the trade, known as "the language of the trade".

DIRECTIONS

The programmed text is laid out in a sequential order. Each objective should be completed before the next one is started. The student will learn the tools and terms of the trade before beginning the shop practices. Study the directions for each objective before the actual steps are begun. Follow each step exactly as stated. If help is needed, call the instructor. Make sure each checkpoint is correct before going to the next objective.

Instructional Objective 1

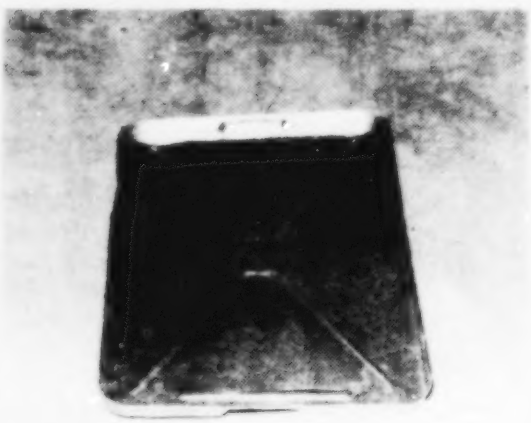
Given a list of general tools the student will identify the purpose of these tools.



STEP 1 – Masonry tools are divided into 2 groups:

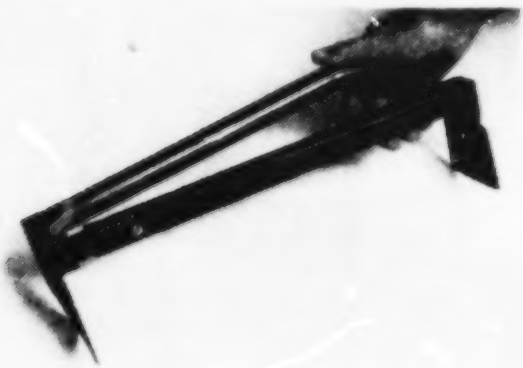
General Tools
Hand Tools

This objective will offer only the general tools.

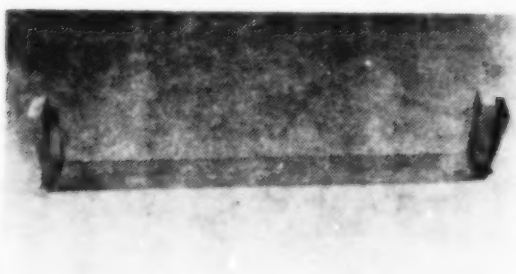


STEP 2 – This is a mortarboard. It is a square board used to hold mortar when laying brick.

STEP 3 – This is a one gallon pail. It is used to measure equal amounts of sandy lime and water.



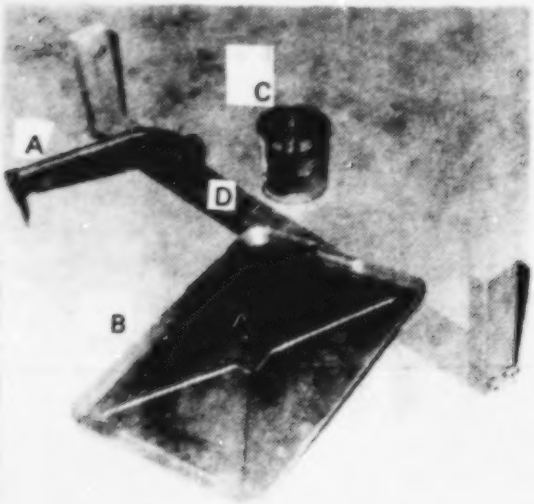
STEP 4 – These are brick grabs. They are used as tongs to clamp and transport six brick at one time.



STEP 5 – This is a workstand. You will practice laying brick on this stand.

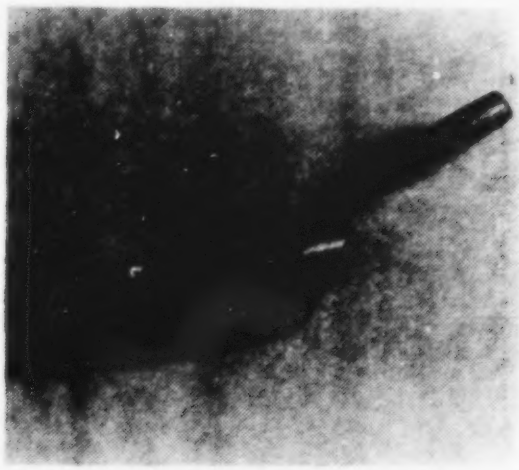
Check Point

On a check sheet provided by your instructor identify these four general tools used in masonry.

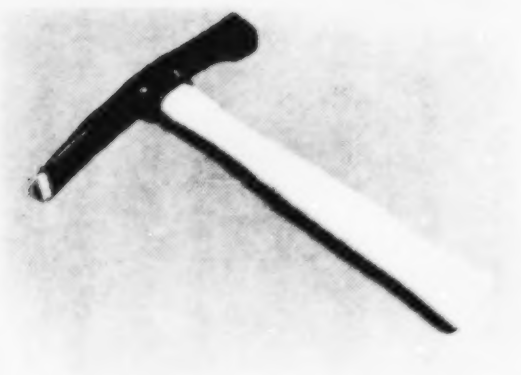


Instructional Objective II

Tool Identification – Given a list of hand tools the student will identify tool by name.

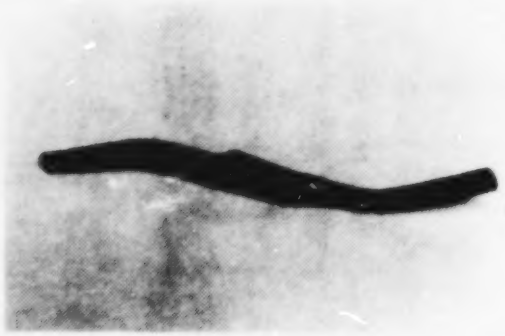


Step 1 – This is a trowel. A trowel is used for handling and spreading mortar.



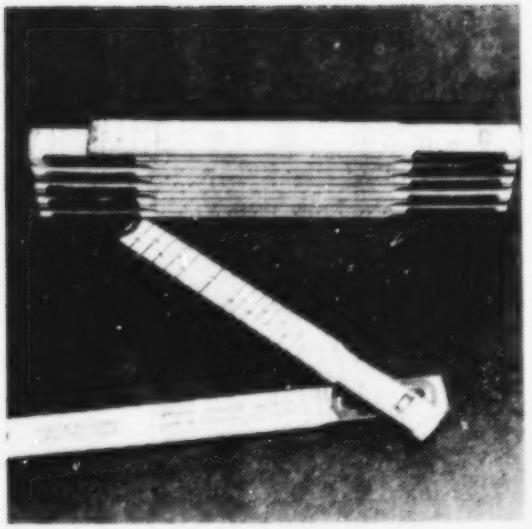
STEP 2 – This is a brickhammer. A brickhammer is a hammer with a special chisel built on the back side of the hammer for cutting bricks.

STEP 3 – This is a level. A level is a device used for leveling and plumbing brickwork.

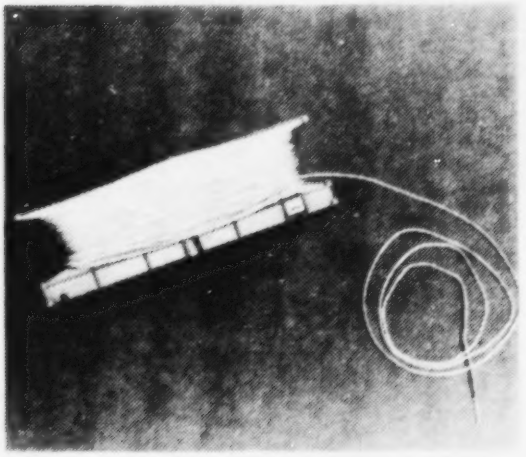


STEP 4 – This is a jointer. A jointer is a tool used to dress up and make the mortar joints between the bricks more waterproof. There are several different types of brick jointers.

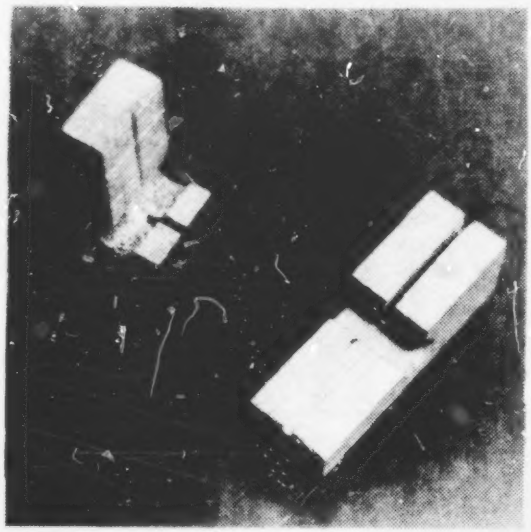
STEP 5 – This is a brickset. The brickset is a wide faced chisel used for cutting brick. The blade of the chisel should be placed on the brick at the place of the desired cut with the level turned toward the student. Give the chisel a hard stroke with the brickhammer to make the cut.



STEP 6 – This is a spacing rule. A spacing rule is a six foot (1.83 m) zig-zag ruler with special numbers on the back side used to gauge out uniform courses of brick. Each number represents the thickness of a brick plus the mortar joint under it. Example: The number 6 gauges the height of a brick plus the mortar joint to be 2–3/4 in. (6.985 cm) high. By following the number six, four courses would be layed to the height of eleven inches (27.94 cm).



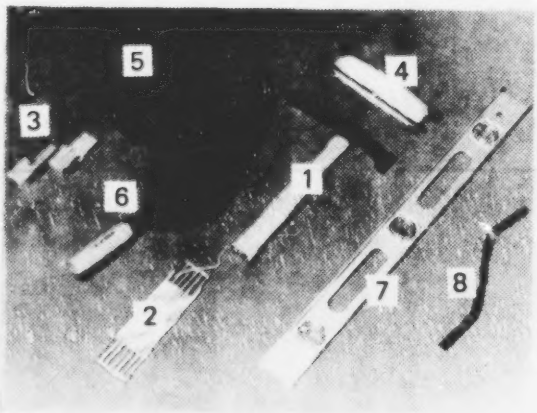
STEP 7 – This is a mason's line. The mason line is a nylon line used as a guide to keep the bricks level and straight when laying brick on a straight wall.



STEP 8 – This is a set of line blocks. Line blocks are used to hold the mason line in place when laying brick on a straight wall.

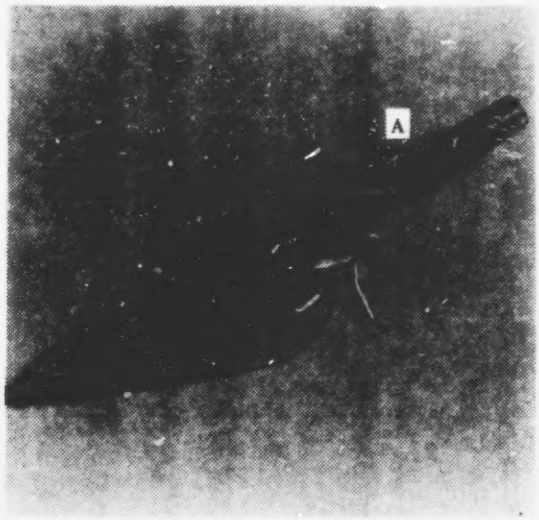
Check Point

On the Student Answer Sheet identify the following 8 tools:

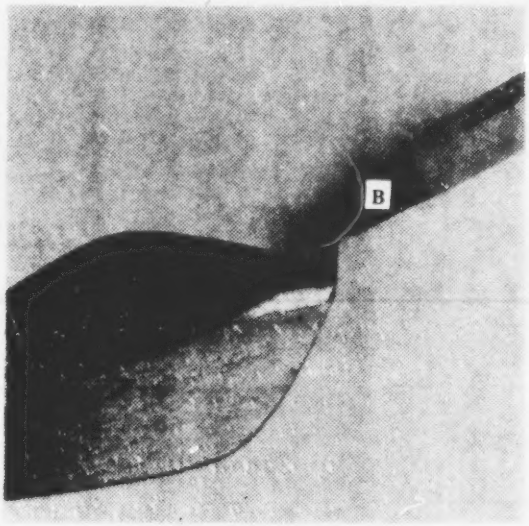


Instructional Objective III

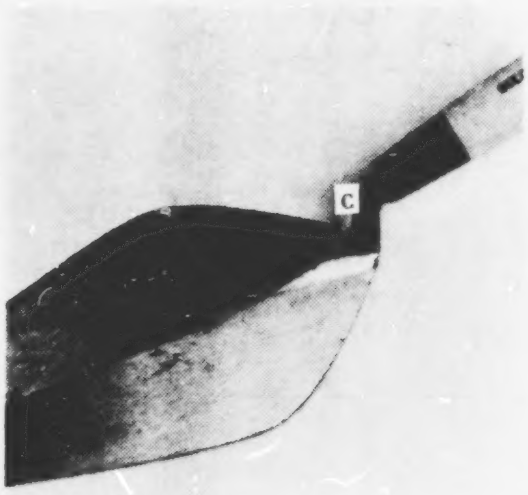
The student will identify the five parts of a trowel.



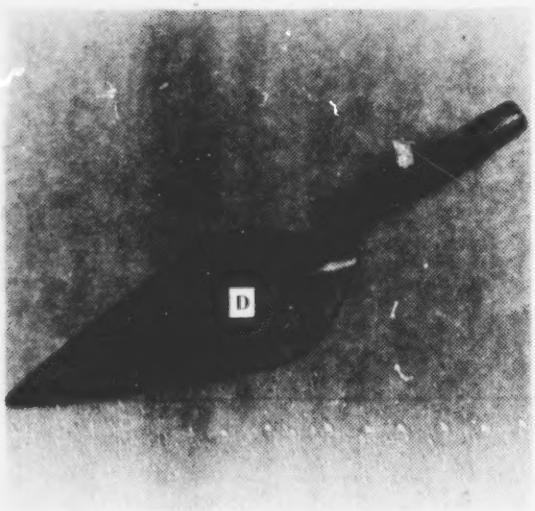
STEP 1 – The trowel has five parts which will be referred to in this activity. The first part (A) is the handle.



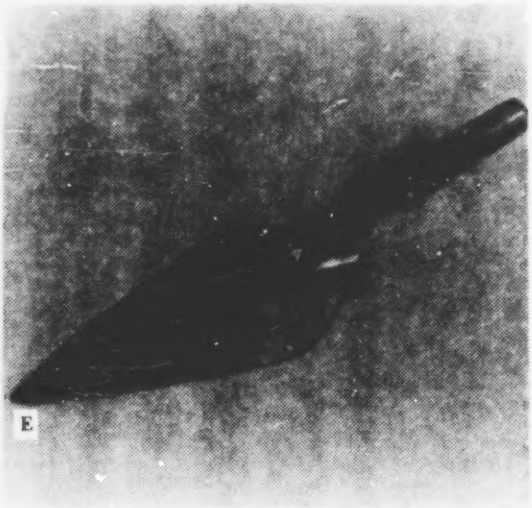
STEP 2 – The small metal part connected to the handle is called the (B) ferrule.



STEP 3 – The metal shaft from the ferrule to the trowel is the (C) shank.



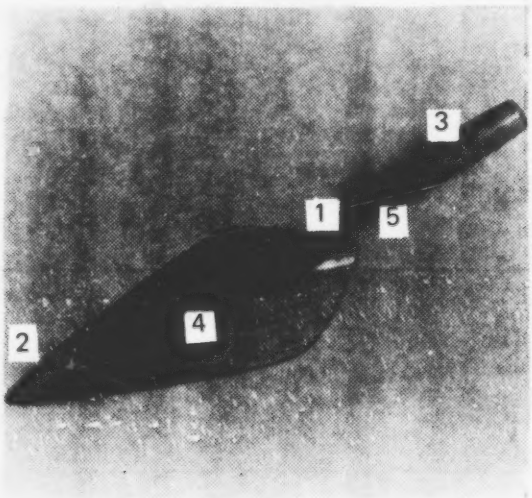
STEP 4 – The flat metal part of the trowel that the shank connects to is the (D) blade.



STEP 5 – The end of the blade of the trowel is the (E) point.

Check Point

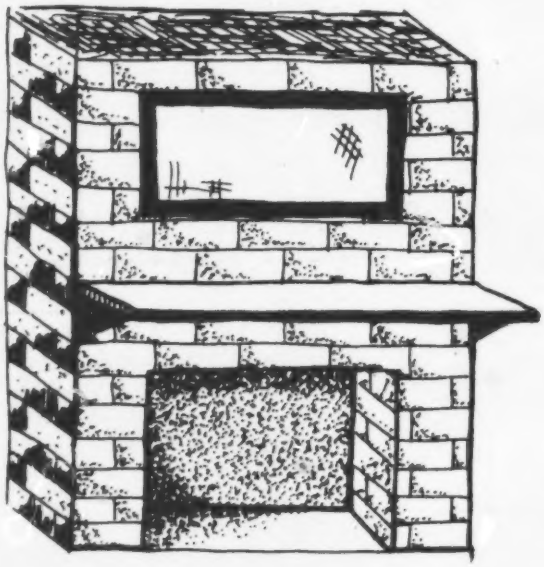
On your student answer sheet identify the five parts of the trowel.



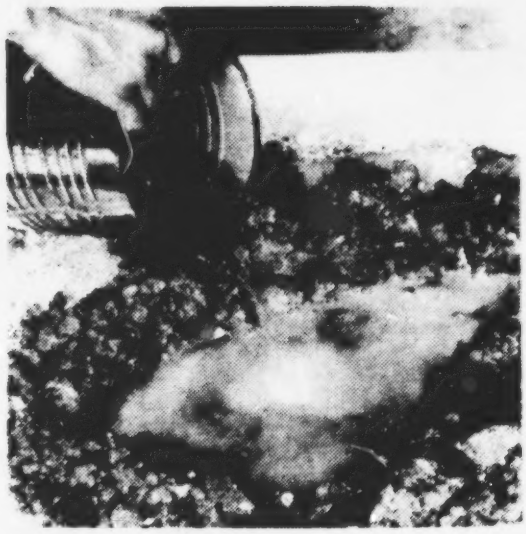
Instructional Objective IV

The student will define the terms used in masonry.

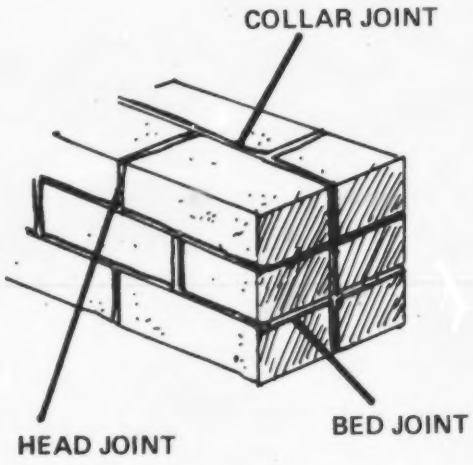
STEP 1 – Read carefully all the terms and definitions. Also, study the pictures which aid in the description of these terms.



STEP 2 – Masonry is the term used to describe anything built from brick, block, stone, or tile that is bonded together with mortar.

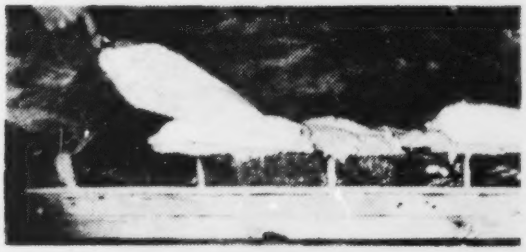


STEP 3 – Practice mortar is the mortar used in this activity. It is made up of sand, lime and water. This mortar can be remixed after it has dried by adding water.



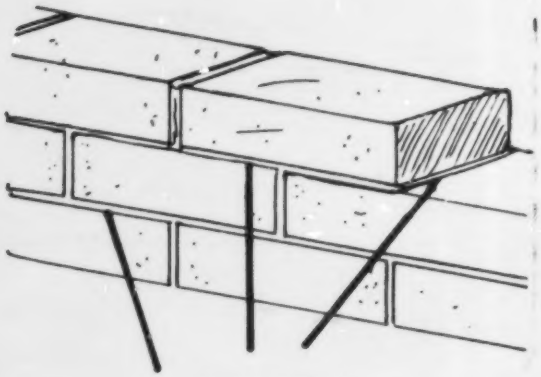
STEP 4 – Joint is the mortar between bricks that bonds them together.

STEP 5 – Lime is a white powder used in making practice mortar.



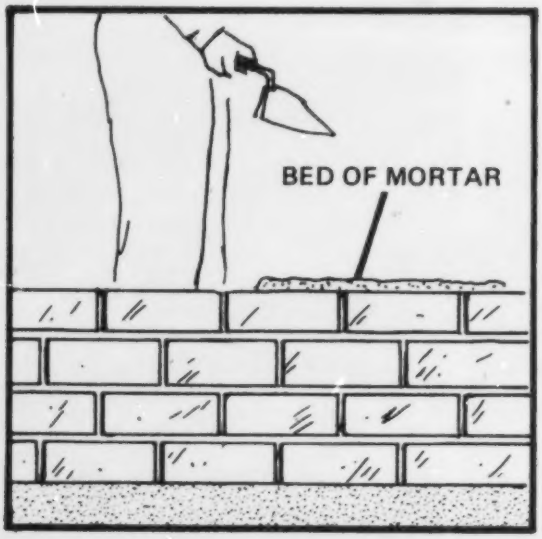
STEP 6 – Spreading mortar is the procedure used to spread enough mortar for several bricks.

STEP 7 – Tempering mortar is the term applied to adding water to mortar and mixing to the proper consistency.

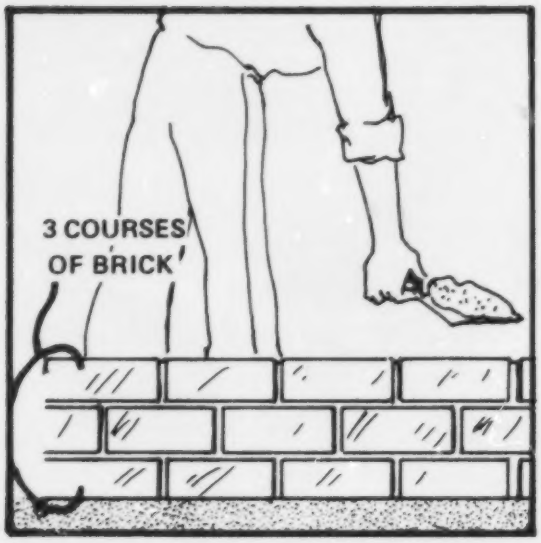


BED JOINTS

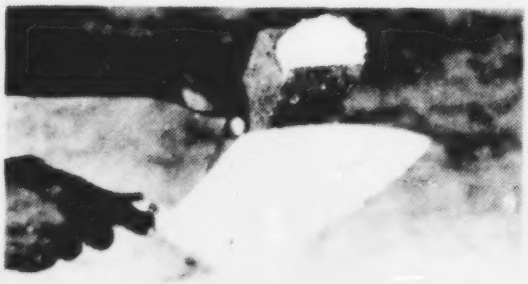
STEP 9 – Bed joint refers to all the horizontal (—) rows of mortar in which brick has been laid.



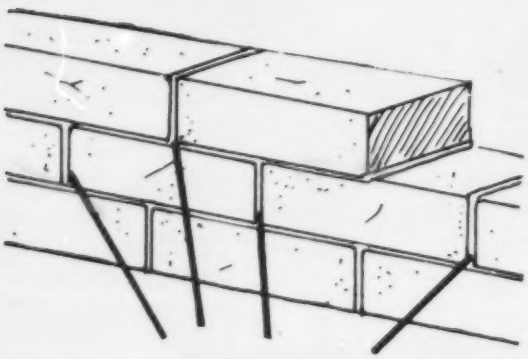
STEP 8 – Bed of mortar is the term used to describe the horizontal (—) layer of mortar on which brick will be laid.



STEP 10 – Course is the term describing a row of brick that has been laid in a wall.

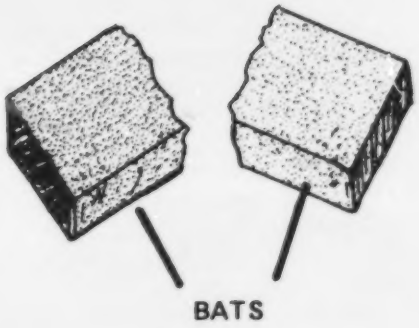


STEP 11 – Buttering is the practice of placing mortar on a brick with a trowel.



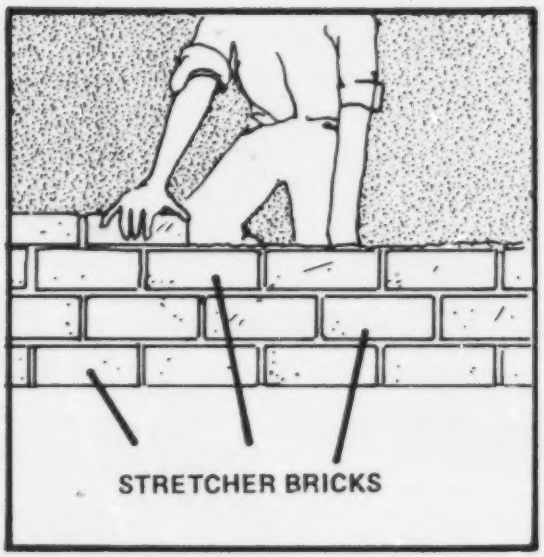
HEAD JOINTS

STEP 12 – A head joint is the vertical (↑) joint between the ends of a brick.



BATS

STEP 13 – A bat is a piece of, or half a brick.



STEP 14 – A stretcher is a brick layed with its greatest dimension horizontal (→), and its face parallel to the wall.

Check Point

On your student answer sheet place the proper definition with the correct picture.

(A) The mortar between bricks that bonds them together.

(B) A white powder used in making practice mortar.

(C) The procedure used to spread enough mortar for several brick.

(D) The term applied to adding water to mortar and mixing to the proper consistency.

(E) A brick laid with its greatest dimension horizontal (→) and its face parallel to the wall.

(F) The term used to describe the horizontal (→) layer of mortar on which brick will be laid.

(G) Refers to all the horizontal (→) layers of mortar in which brick has been laid.

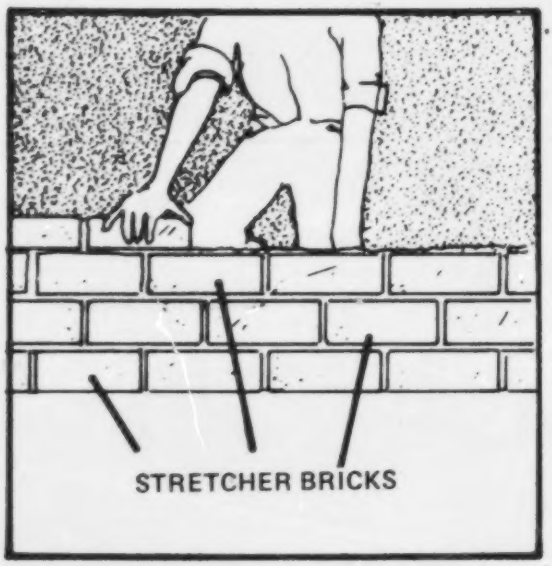
(H) The term describing a row of brick that has been laid in a wall.

(I) The practice of placing mortar on a brick with a trowel.

(J) The vertical (↑) joint between the ends of brick.

(K) A piece of, or half a brick.

1 __



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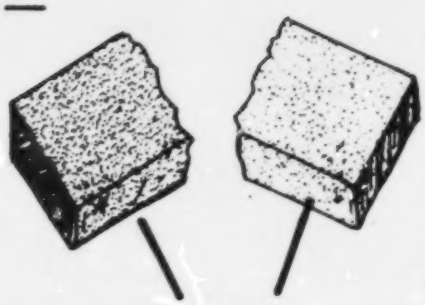

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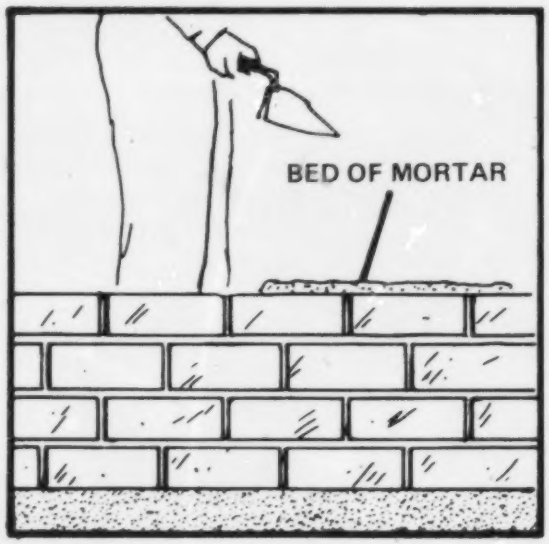

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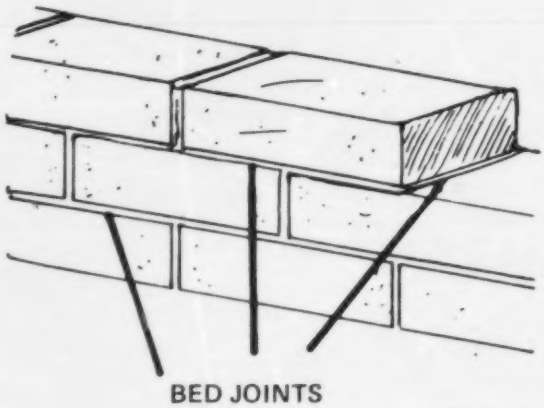

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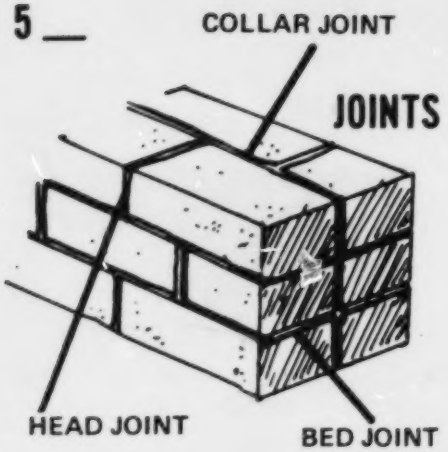
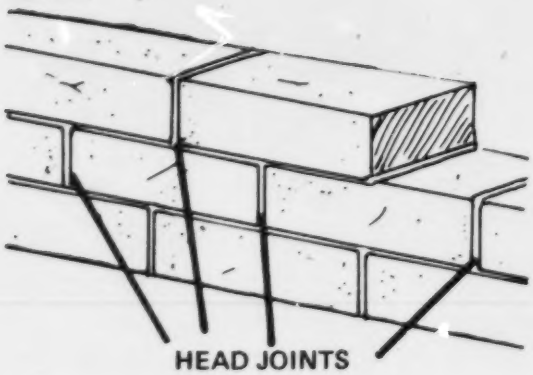

COLLAR JOINT
JOINTS
HEAD JOINT
BED JOINT

6 _____

BUTTERING

7 _____


HEAD JOINTS

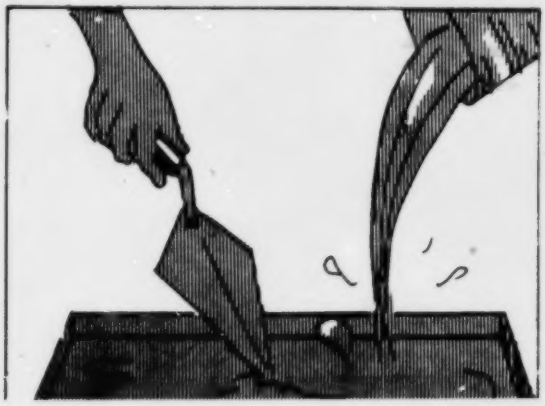
8 _____

SPREADING MORTAR

9 _____

LIME
50 lbs.

10 _____



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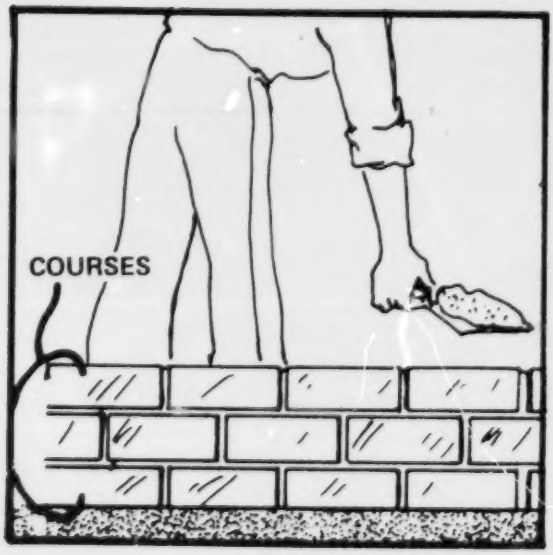
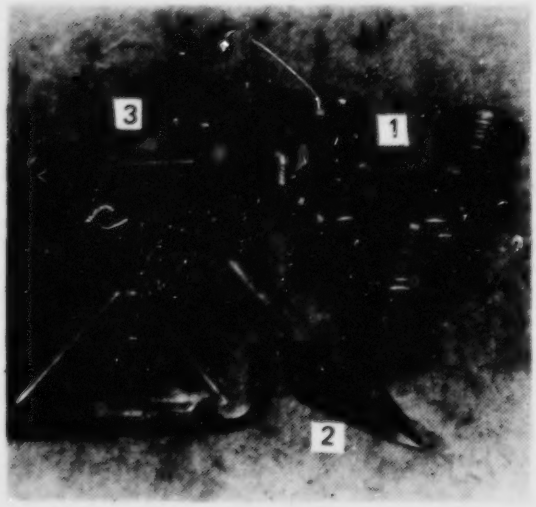

COURSES

Instructional Objective V

The student will prepare area for work.



STEP 1 – Obtain five one gallon pails.

STEP 2 – Obtain one trowel.

STEP 3 – Obtain one mortarboard.

Check Point

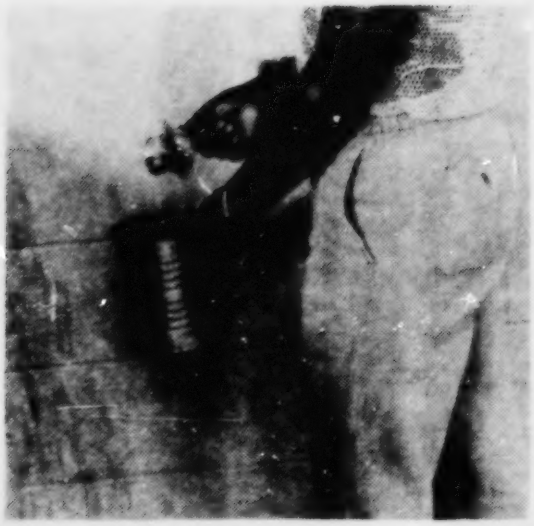
Check with your instructor before proceeding to mix your practice mortar.

Instructional Objective VI

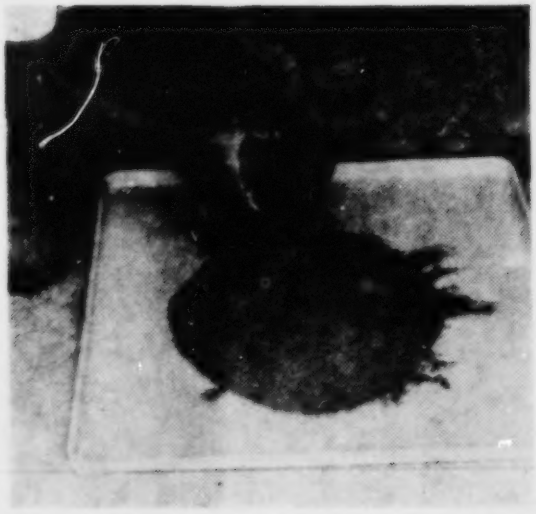
The student will mix practice mortar.

STEP 1 – Fill three pails with sand.

STEP 2 – Fill one pail with lime.



STEP 3 – Fill one pail with water.

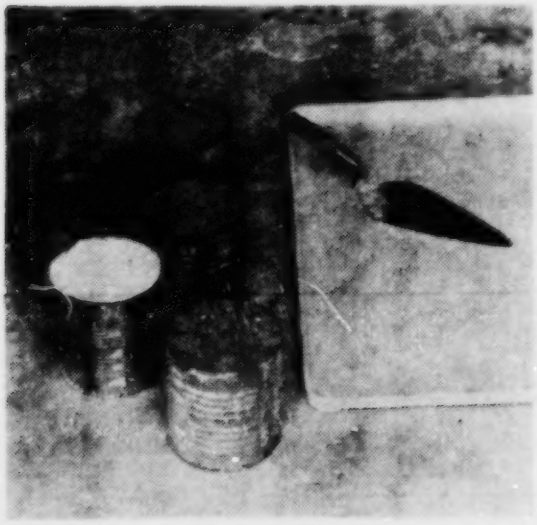


STEP 4 – Empty three one gallon cans of sand on the mortarboard.

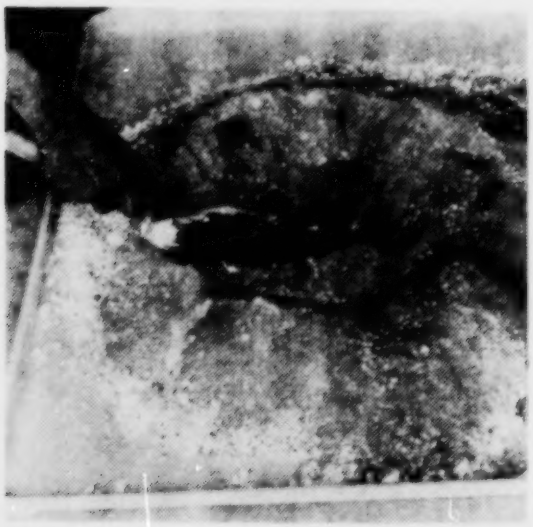
STEP 5 – Pour one can of lime on top of the sand on the mortarboard. Pour the lime onto the sand very carefully. Lime is very dusty and not very pleasant to breathe.

Check Point

Does your workstand look like this picture?



STEP 6 – Mix the sand and the lime together thoroughly by troweling up the material from the side and the bottom of the pile and placing it on the top of the pile.

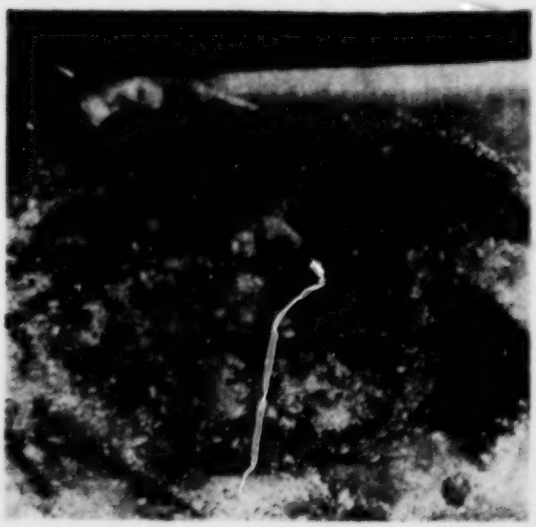


STEP 7 – With the point of your trowel, open up a large opening in the top of the sand and lime mixture.

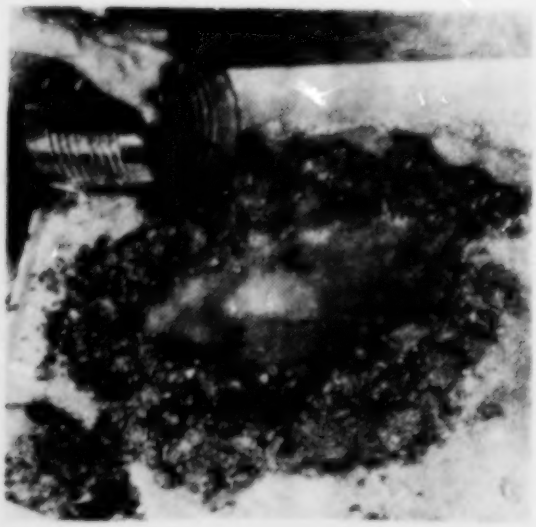
Check Point

Is your sand and lime mixed thoroughly? If not continue to mix until no spots of lime or sand are seen.

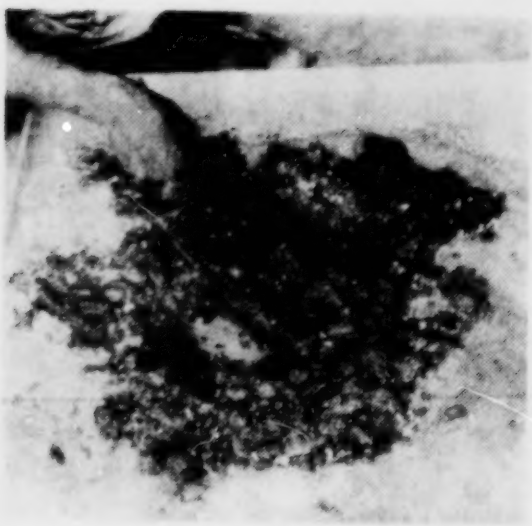
STEP 8 – Pour 1/2 gallon can of water into the opening of the mixture.



STEP 9 – Trowel the mixture from the side of the pile into the center. Work carefully so the water will not splash on your clothing.



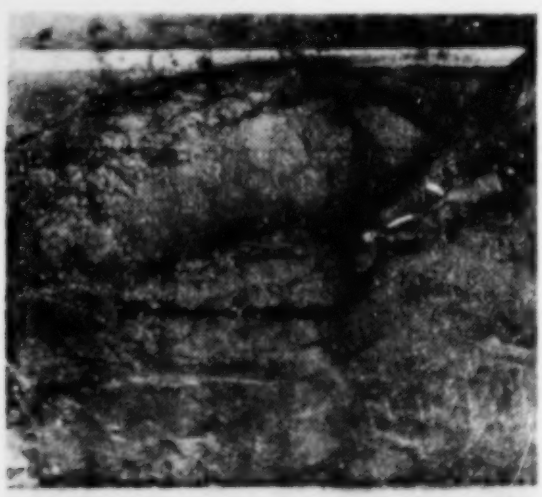
STEP 11 – Add more water as needed. Continue troweling mixture until enough water is mixed in to make the mixture soft and spongy.



STEP 10 – Continue troweling mixture into center of pile until all the water is absorbed.

Check Point

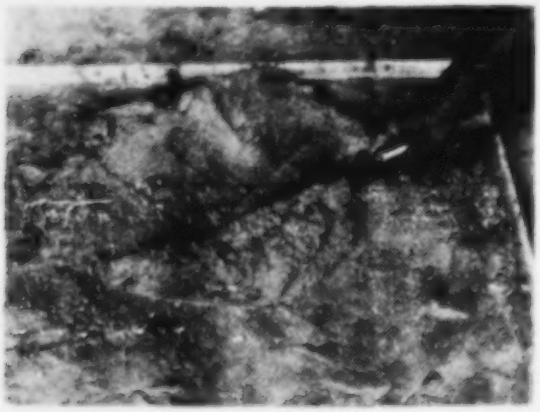
Mortar should be soft enough to slide off the trowel easily, but stiff enough to stand in a neat pile on your board. If mortar is too soupy, add more sand and lime. If mortar is too stiff, add more water.



Instructional Objective VII

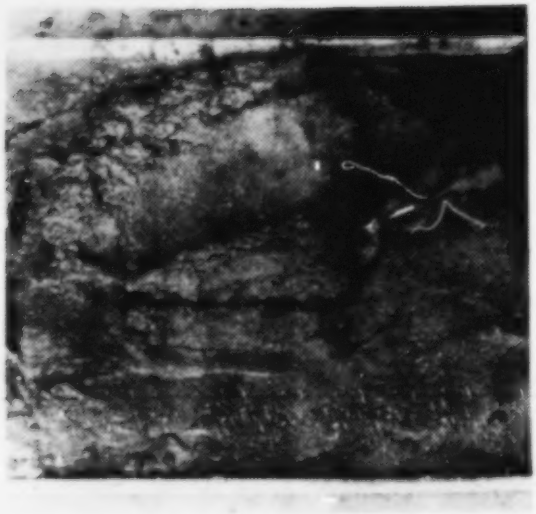
The student will spread a trowel full of mortar. The trowel must be held properly before gathering mortar onto it. A full trowel of mortar should be picked up to spread properly.

STEP 1 – Grasp the trowel in your right hand firmly, (left hand if student is left handed) make sure the thumb is on top of the handle near the ferrule, and the index finger is on the bottom of the handle near the ferrule.

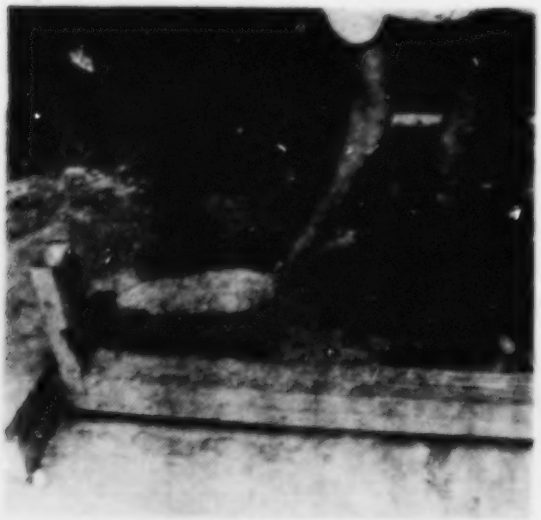


STEP 2 – Cut a small amount of mortar from the pile on the trowel. Cut the mortar in such a manner that the mortar is torpedo like and about the length of the trowel.

STEP 3 – Aim the point of the trowel at the end of the torpedo-like mound of mortar.

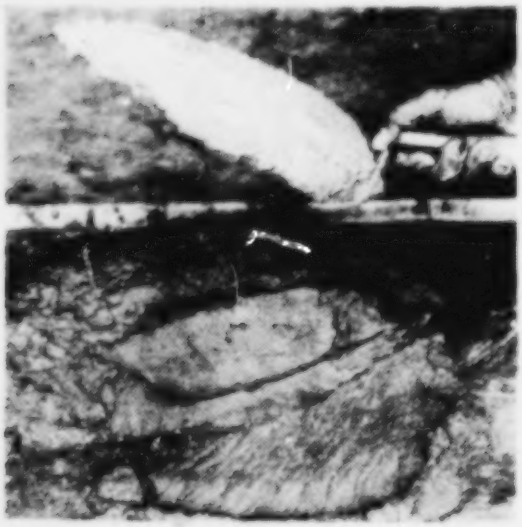


STEP 4 – Slip the trowel under the small pile without disturbing the mortar.



STEP 5 – When spreading mortar the trowel should not be held too rigidly. The arm holding the trowel should be extended from the body, and the trowel should be held over and just above the wall or workstand in which the mortar is to be spread.

STEP 7 – Then snap your wrist and the point of your trowel down toward the workstand. Be careful not to splatter mortar on your classmates.



STEP 6 – You must set the mortar on your trowel. This is done by first raising the point of the trowel up.

STEP 8 – Start the spread by tilting the trowel to the left slightly and giving the wrist a slight snap. This allows a small amount of the mortar to slide off the trowel onto the mortarboard.

STEP 9 – At the same time that the mortar is sliding off the trowel, give the trowel a quick but smooth pull toward your body. When the spread is started, the trowel should be tilted as it is pulled toward the body.

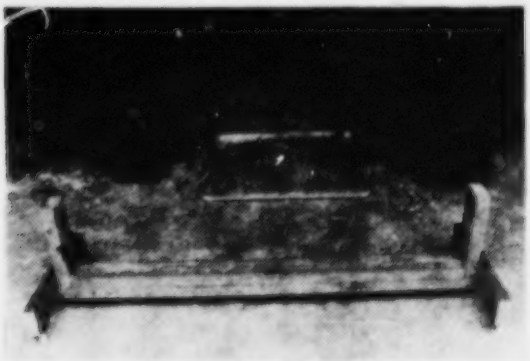
STEP 10 – The trowel should be tilted completely on its edge by the time the spread is finished.

Check Point

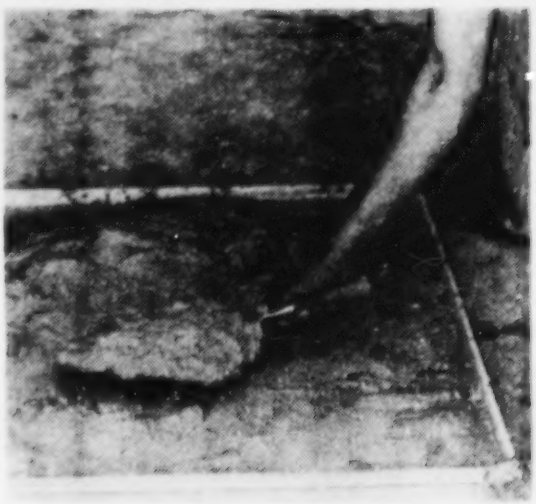
Try spreading mortar for two or three bricks within one spread without dropping the mortar on the floor. This should be practiced for several times to acquire the proper skill on your mortarboard.

Instructional Objective VIII

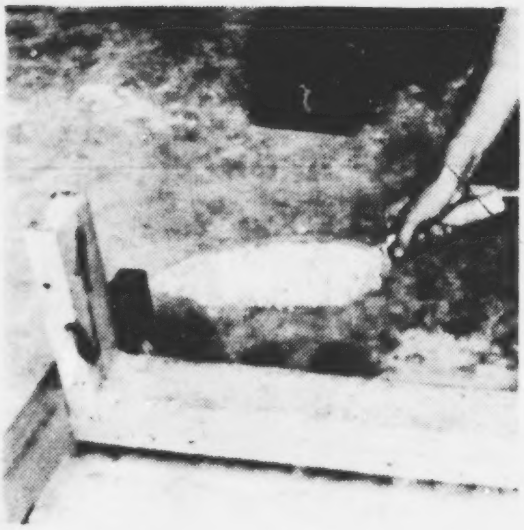
The student will riffle and cut off excess mortar on workstand.



STEP 1 – Place workstand next to your mortarboard.

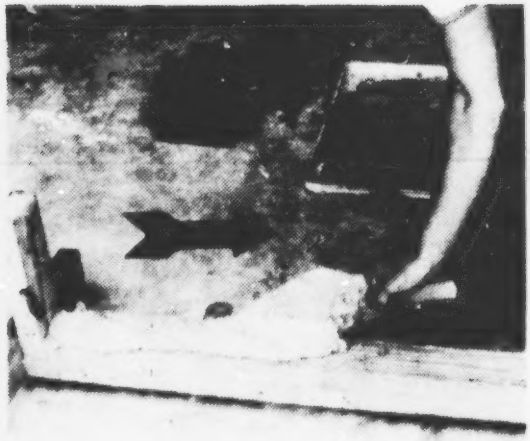


STEP 2 – Set mortar on trowel (refer to Instructional Objective VII).

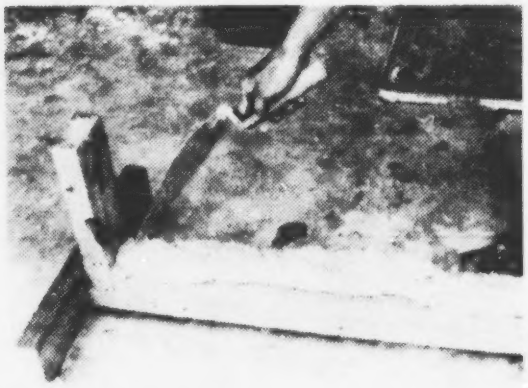


STEP 3 – Hold set mortar over workstand so that the blade of the trowel is parallel to the base of your workstand.

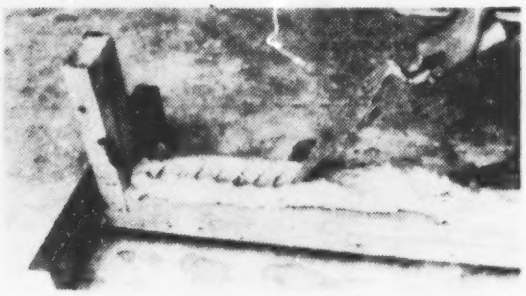
STEP 4 – Tilt some mortar on the workstand.



STEP 5 – Pull trowel toward you, and you have set a mortar bed.



STEP 6 – Riffling is done by running the point of the trowel down the center of the spread mortar. The bottom of the blade of the trowel should be turned upward.



STEP 7 – Move your hand from left to right slightly while pulling the trowel down the center of the mortar.

STEP 8 – Cutting the excess mortar off is done by tilting the trowel to the right at about a 45 degree angle. The point of the trowel should be tilted down slightly. Give the trowel a forward push, cutting off the excess mortar. This should be done with enough speed that the mortar will be caught with the trowel and not fall on the floor.

Check Point

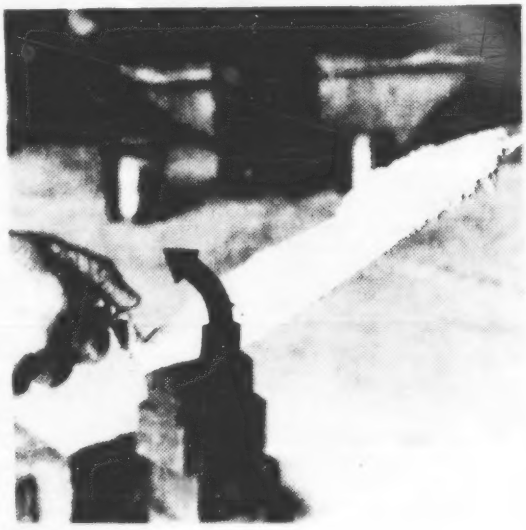
Is your mortar spread evenly on both edges of your workstand or wall? Can you cut off the excess mortar without dropping it?

Instructional Objective IX

The student will set the mortar on the trowel for buttering a brick.

The mortar must be set on the trowel before buttering the brick. The morter is set on the trowel to keep the mortar from falling off before reaching the brick.

STEP 1 – Pick up a small amount of mortar on the point of the trowel.



STEP 2 – Tilt the point of the trowel upward by bending the wrist.

STEP 3 – Snap the wrist downward lightly to set the mortar. Caution – do not snap the wrist too hard. The mortar should stick to the trowel.

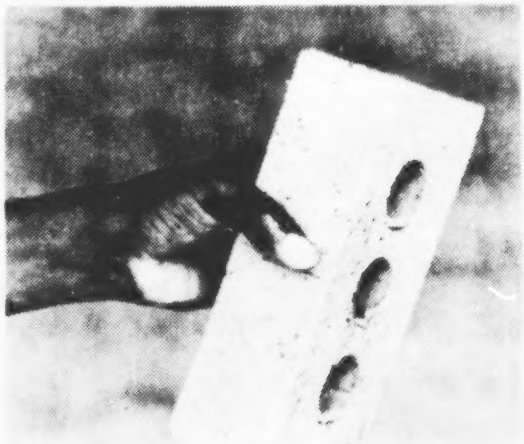
Check Point

With a quick swinging motion turn the trowel upside down above your waist. The mortar should stick to the trowel for a few seconds before falling off. Keep setting mortar until you can do this.

Instructional Objective X

The student will butter a brick properly.

A brick must have a head joint on the end of it before the brick is laid. This is called buttering a brick.



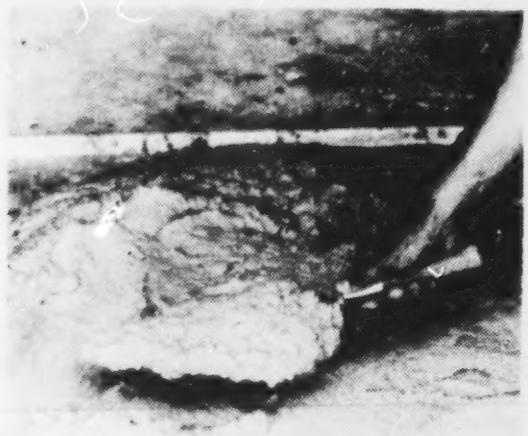
STEP 1 – Pick up a brick with your left hand and turn the forward end upward.

STEP 2 – Pick up a small amount of mortar and set it on the point of your trowel.

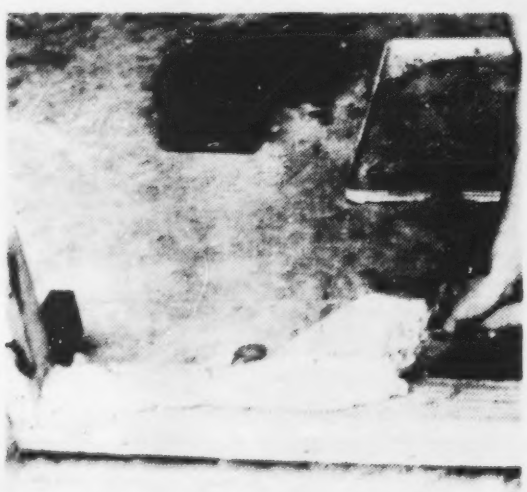
Instructional Objective XI

The student will lay a course of brick on the workstand.

The brick must be laid along side and level with the line. The brick should be laid about 1/16 inch from the line to keep from disturbing the line. Follow each step carefully.



STEP 1 – Set mortar on trowel as in Instructional Objective VII.



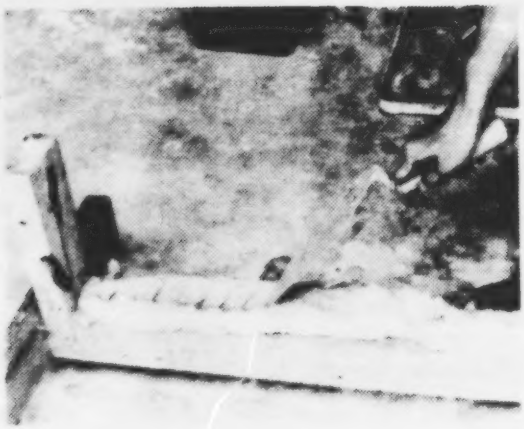
STEP 2 – Spread a mortar bed across the bottom of your workstand.

STEP 3 – Tilt the trowel above the brick.

STEP 4 – With one motion bring your trowel up and place the mortar on the end of your brick. Your trowel should by-pass the brick as the mortar comes off the trowel and sticks to the brick.

Check Point

Is the end of your brick completely covered with mortar? Did you drop part of your mortar on the floor? All the mortar should be placed on the end of the brick from your trowel. Keep doing this until you have it correct.



STEP 3 – Riffle the mortar bed.

STEP 4 – Cut off excess mortar.

STEP 5 – Butter end of a brick.

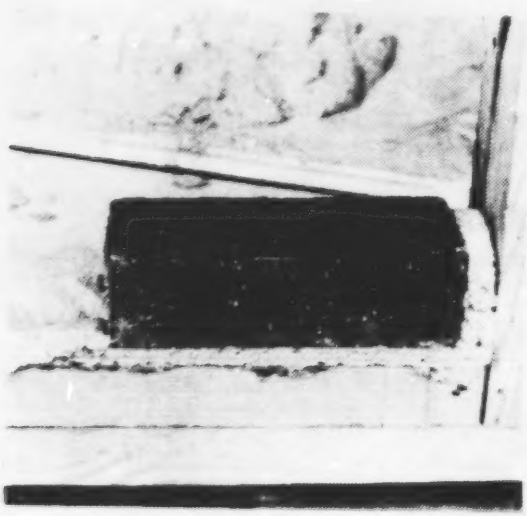
STEP 6 – Place the brick against the right end of the workstand.

STEP 7 – With your left hand on top of the brick, press the brick down until it becomes level and straight.

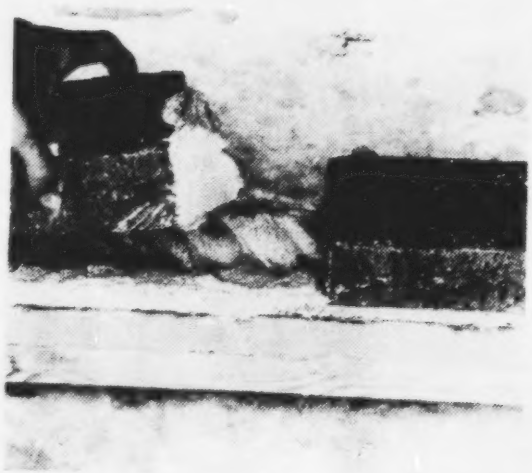
STEP 8 – Cut the excess mortar that is squeezed out of the bed joint off with your trowel.

Check Point

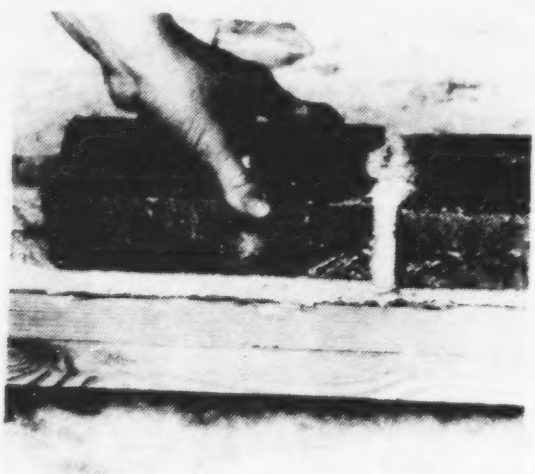
Does your brick look like this?



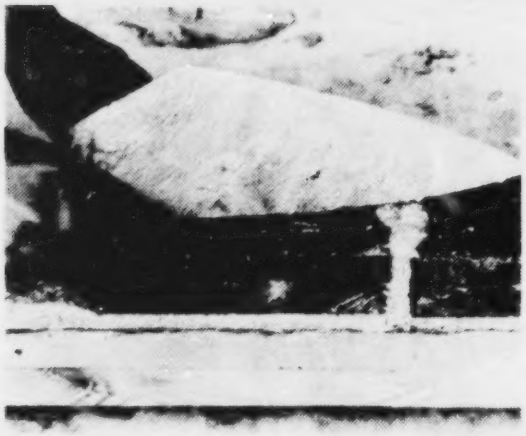
STEP 9 – Butter up a head joint on your second brick.



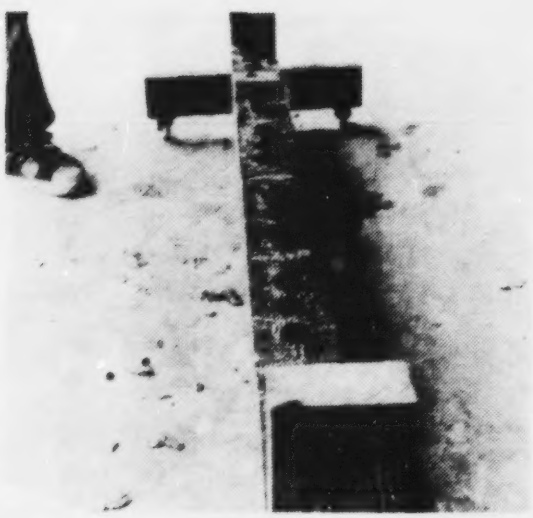
STEP 10 – Place your second brick behind your first brick.



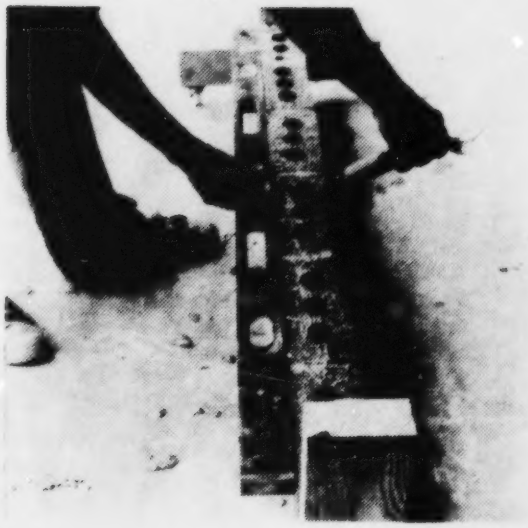
STEP 11 – Press firmly to set brick in mortar bed.



STEP 12 – Tap gently on brick until both bricks are even.



STEP 13 – Continue until you have finished this bottom course of stretching bricks.



STEP 14 – Take your level and see that your bricks are even from side to side.

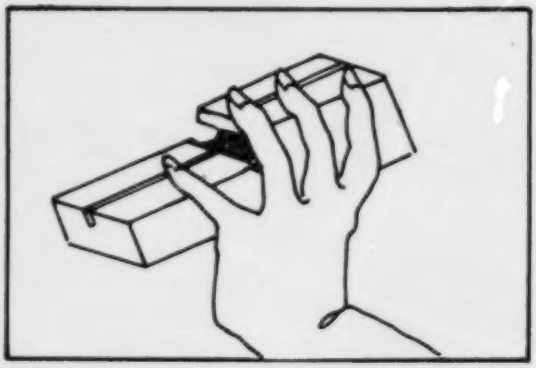
Check Point

Have your instructor check your work before attempting your next objective.

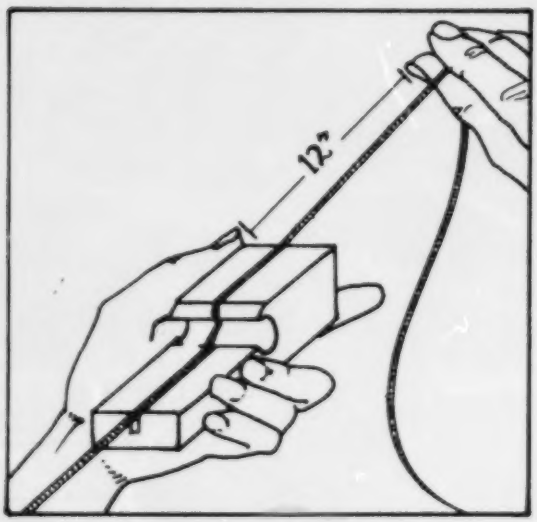
Instructional Objective XII

The student will attach a mason line to a line block.

The line must be attached to the block in a special way for the line to fit the wall properly and not slip loose. Follow each step carefully.

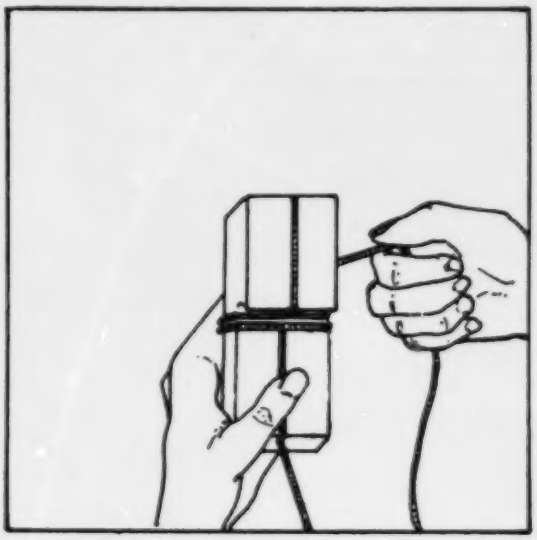


STEP 1 – Pick up one line block with your left hand. Hold the line block in your left hand with the groove in the block turned upward and the small end of the block turned toward your body.



STEP 2 – With the end of the line in your right hand, slide the line through the groove in the line block. Pull the line through the groove until about one foot of line is extended from the large end of the block.

STEP 3 – Hold the line and the line block with the left hand to keep the line from slipping. Take the end of the line with the right hand. Pull down and toward your body.



STEP 4 – Then wrap the line over the center of the line block three times very tightly.

STEP 5 – On the fourth time around the block, pull the end of the line through the groove to the right on the largest part of the line block.

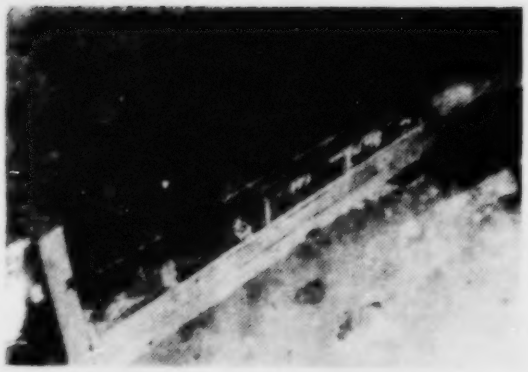
Check Point

Hold the line block in the left hand. Catch the long part of the line and give it a hard pull. If the line does not slip, it is attached to the line block correctly. If the line does slip, take the line off the block and follow the steps again. If you need help call your instructor. Use the same procedure for the other line block.

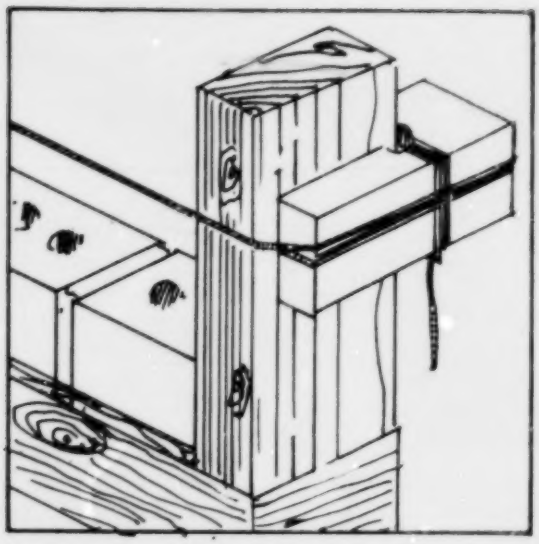
Instructional Objective XIII

With one line block already attached to the line, the student will stretch the line and attach the second line block to the line at the proper place and hang the line on the work stand at the second set of notches.

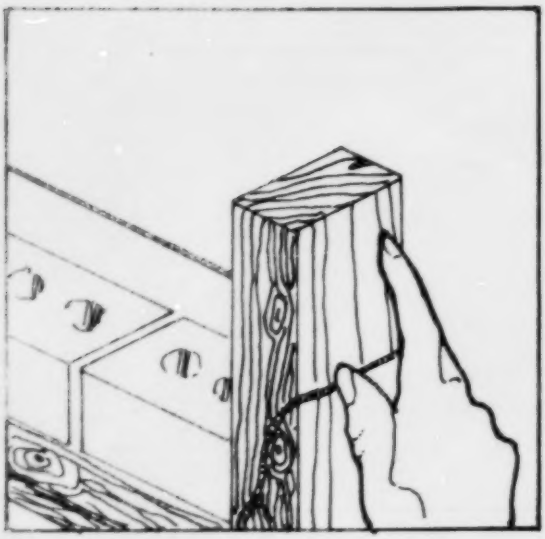
STEP 1 – Holding the first line block with the left hand, place the block on the left side of the workstand.



STEP 2 – Hold the line tight with the right hand. Turn loose of the first line block. The first line block will not fall if the line is kept tight. Slide your right hand along the lines toward the right side of the workstand. Be sure to keep line tight as you slide your right hand along the line. Stop your right hand when it reaches the right side of the work stand.



STEP 4 – The excess line should be wrapped around the line block with the right hand at the center of the line block. You will need to hold the line and the line block with the left hand while wrapping the excess line with the right hand.



STEP 3 – Make sure the line is kept tight at all times. Attach the second line block to the line at the point of the line that measures to the right side of the work stand. The line block is attached by sliding the line through the groove in the block just as the first block was attached. Make sure that the small end of the line block is heading toward the center of the workstand.

STEP 5 – Attach the second line block to the right side of the workstand.

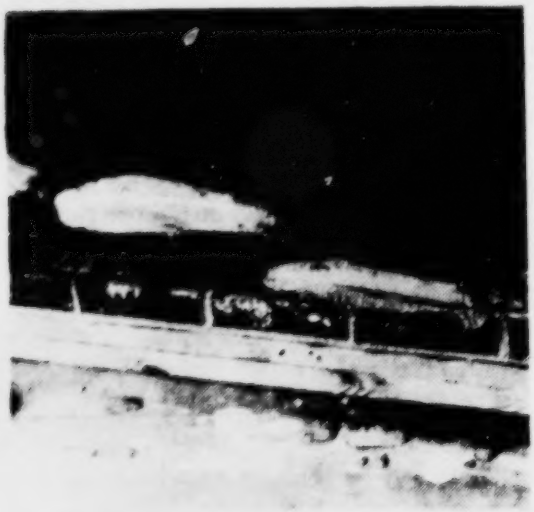
Check Point

Check to make sure that the line is tight enough to keep the line blocks from falling.

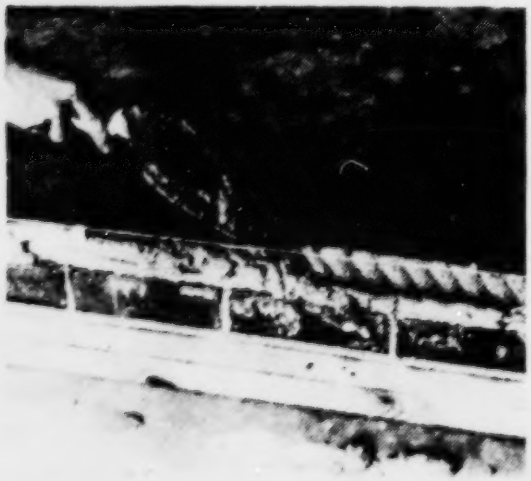
Instructional Objective XIV

The student will learn to lay brick to the line on second course.

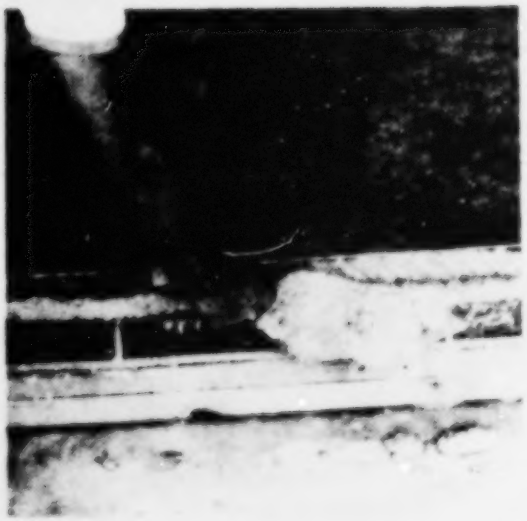
The head joints on the second course must meet in the center of the brick on the first course. This is known as a half-lap. To accomplish this the second course is started with a brick bat, one half brick.



STEP 1 – Spread the mortar on top of the first course, for the second course of brick.



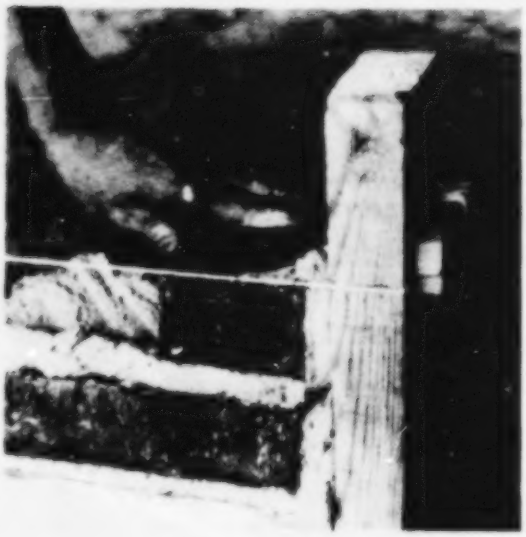
STEP 2 – Riffle the mortar for the second course of brick.



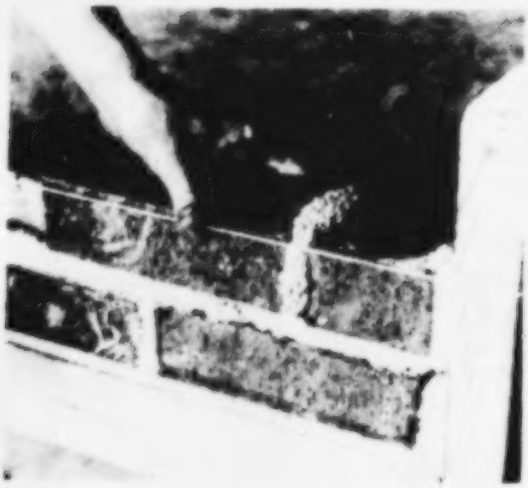
STEP 3 – Cut off excess mortar.

STEP 4 – Pick up a one-half brick.

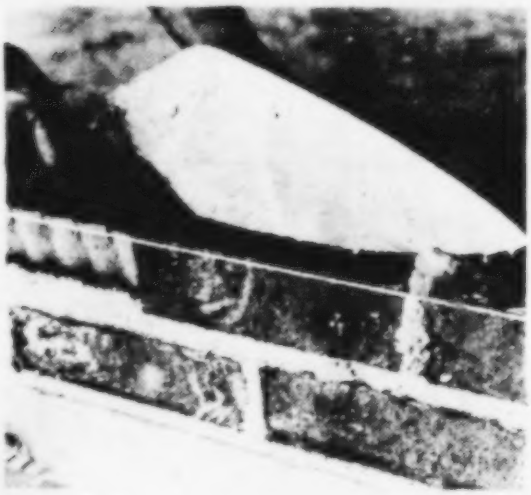
STEP 5 – Butter a head joint on the edge of the bat.



STEP 6 – Lay the one-half brick to the line at the right side and the end of the workstand on top of the first course.



STEP 7 – Butter a headjoint on the second brick and lay it against the one-half brick and to the line. Be sure to cut the excess mortar off of each brick as it is laid.



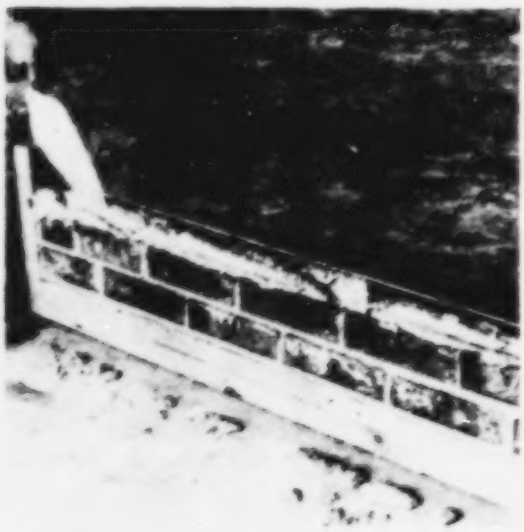
STEP 8 – Continue laying brick to the line and on top of the first course. NOTE: The last brick on the second course will be a one-half brick.

Check Point

Check to make sure all brick are laid level and straight with the line. If you see any holes in the head or bed joints pick up a small amount of mortar from the floor and press it into the hole with your fingers. Lay courses three and four. NOTE: Courses one and three are laid the same, and courses two and four are the same.

Instructional Objective XV

The student will lay a third course of brick on the second course.



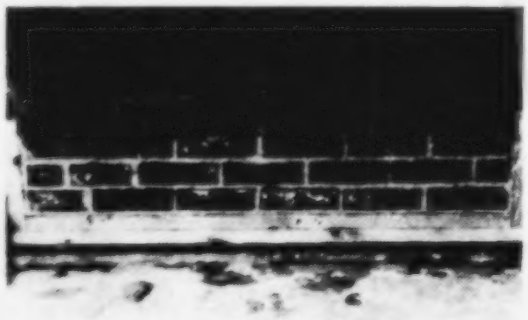
STEP 1 – Spread mortar.

STEP 2 – Riffle mortar and cut off excess.

STEP 3 – Follow the same steps as in Instructional Objective XI.

Check Point

Does your third course of brick look like this? If not, relay your brick. If it does look like the pattern, have your instructor check your completed work.

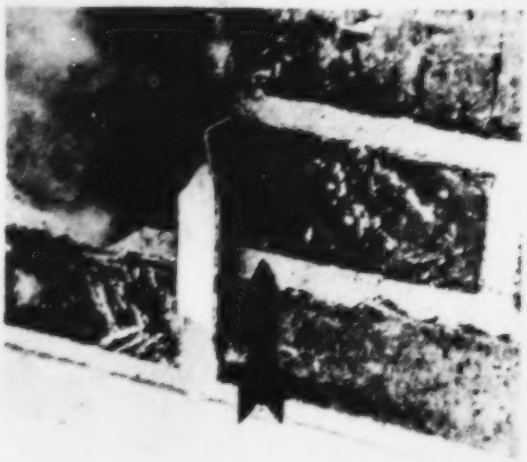


Instructional Objective XVI

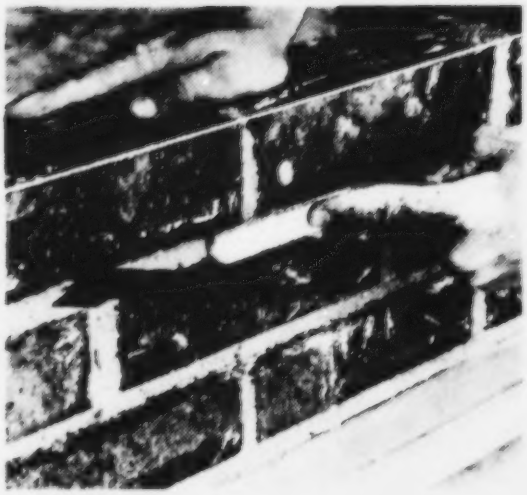
The student will operate the concave jointer correctly.

The head joints must be jointed before the bed joints. Head joints are vertical and bed joints are horizontal.

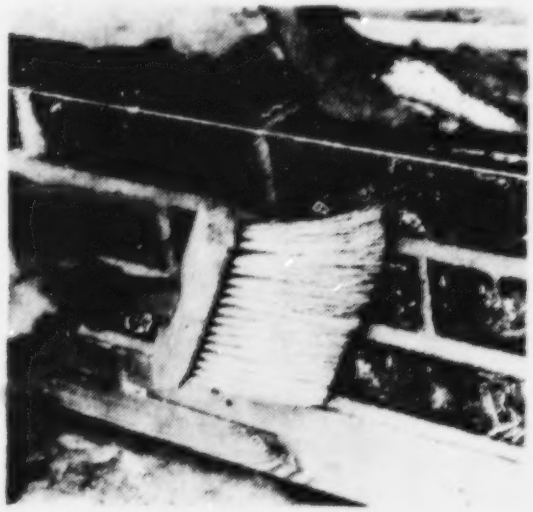
STEP 1 – The head joints on the top course must be jointed from the top down (from the top of the wall to the center of the wall).



STEP 2 – The head joints at the bottom of the wall should be jointed upward (from the bottom to the center of the wall).



STEP 3 – Joint the bed joints with a pulling motion, starting at the end of the wall and jointing toward the center of the wall.



STEP 4 – Brush off finished work.

Check Point

Step back about two steps and inspect your work. Are all the mortar joints jointed straight and smoothly? Ask your instructor to check your work.

OPTIONAL

Instructional Objective XVII

Lay out and build a 12 in. x 12 in. (30.48 cm x 30.48 cm) brick pier ten courses high in the proper bond.

Directions

A. A 12 in. x 12 in. (30.48 cm x 30.48 cm) pier requires four bricks per course. Each brick is laid at 90 degree angles to one another to form a square.
B. Each course must be leveled as soon as the bricks are laid.
C. The first course should be squared with a framing square.
D. The second course should be laid on top of the first course with brick laid in the opposite direction.

STEP 1 – Spread mortar for one and one-half bricks. Lay first brick. Spread mortar for second brick.

STEP 2 – Butter up head joint on side of second brick and lay the brick against the first brick forming right angle. Continue laying bricks 3 and 4 in the same manner. Brick 4 must have a head joint on one end and one side to complete the first course.

STEP 3 – Place the level on top of each side of the pier. The bubble in the center vial should be in between the black lines on the vial. If not, tap the brick with the blade of the trowel until the bricks are level. Do not hit level with trowel. This will damage the level.

STEP 4 – Place the framing square against each corner to insure squareness of pier. Brick should fit framing square on all four corners.

Check Point

Check head joints to make sure they are not over 1/2 in. (1.27 cm) big. Check the tops of all sides of pier to make sure they are level. Check sides with square to make sure pier is square.

STEP 5 – Spread mortar and lay second course. Second course should be laid in the same manner as the first except the brick will be laid in opposite directions. This forms a 1/2 lap pattern.

STEP 6 – After laying second course be sure to level the top of each side. Place level in upright position against one corner of pier. Make sure bubble is in the center of the vial. Check both sides of all four corners for plumbness.

STEP 7 – Continue building pier using steps for first and second courses. Note: First, third, fifth, seventh, and ninth courses are alike. Second, fourth, sixth, eighth, and tenth courses are alike.

Check Point

Check top of pier with level. Are all four sides of the top level? Check both sides of all four corners with level for plumbness. Corners should be plumb from bottom to top. Check the bottom course and the top course with the framing square. All corners should fit to the square.

STEP 8 – Tool all joints with a concave jointer. Point up any hole with mortar.

STEP 9 – Brush project down with brush.

Check Point

Check all mortar joints for holes and smoothness. Ask the instructor to check your project.

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861.131-010 BRICKLAYER SUPERVISOR (const.)

Supervises and coordinates activities of workers engaged in laying brick, tile, cinderblock, and other materials to construct or repair structures, such as walls, arches, sewers, and partitions: Assigns workers to specific duties. Inspects work in progress to determine conformance to specifications. Trains new workers in use of handtools. May supervise workers engaged in laying only tile, and be designated TILE SETTER SUPERVISOR (const.). Performs duties as described under SUPERVISOR (any ind.).

861.131-018 STONEMASON SUPERVISOR (const.)

Supervises and coordinates activities of workers engaged in erecting stone structures, such as piers, walls, and abutments and laying walks, curbstones, and other types of masonry. Performs duties as described under SUPERVISOR (any ind.).

861.381-014 BRICKLAYER (brick & tile) kiln repairer.

Repairs and rebuilds tunnel, periodic, and shuttle kilns used to burn tile, brick, and sewer pipe: Examines kilns afterburning cycles to determine need for repair. Lays firebrick to construct casing walls, flues, feather walls, and burner wickets, using mortar, trowels, plumbobs, hammers, and brick. Spreads plastic refractories over exposed brickwork to protect against deterioration by heat. Lays brick flooring in periodic kilns. May be designated according to type of kiln repaired as TUNNEL-KILN REPAIRER (brick & tile; pottery & porc.).

861.381-018 BRICKLAYER (const.)

Lays building materials, such as brick, structural tile, and concrete cinder, glass, gypsum, and terra cotta block (except stone) to construct or repair walls, partitions, arches, sewers, and other structures: Measures distance from reference points and marks guidelines on working surface to lay out work. Spreads soft bed (layer) of mortar that serves as base and binder for block, using trowel. Applies mortar to end of block and positions block in mortar bed. Taps block with trowel to level, aline, and embed in mortar, allowing specified thickness of joint. Removes excess mortar from face of block, using trowel. Finishes mortar between brick with pointing tool or trowel. Breaks bricks to fit spaces too small for whole brick, using edge of trowel or brick hammer. Determines vertical and horizontal alinement of courses, using plumb bob, gageline (tightly stretched cord), and level. Fastens brick or terra cotta veneer to face of structures, with tie wires embedded in mortar between bricks, or in anchor holes in veneer brick. May weld metal parts to steel structural members. May apply plaster to walls and ceiling, using trowel, to complete repair work [PLASTERER (const.)]. May be designated according to material used as CINDER-BLOCK MASON (const.); CONCRETE-BLOCK MASON (const.); TERRA-COTTA MASON (const.); or work performed as BRICKLAYER, MAINTENANCE (any ind.). When specializing in construction of specified structures is designated according to specialty as BRICKLAYER, SEWER (const.); CHIMNEY BUILDER, BRICK (const.). Additional titles: BLOCK SETTER, GYPSUM (const.); HOLLOW-TILE-PARTITION ERECTOR (const.); PLASTER-BLOCK LAYER (const.); SILO ERECTOR (const.).

861.381-038 STONEMASON(const.)

Sets stone to build stone structures, such as piers, walls, and abutments, or lays walks, curbstones, or special types of masonry, such as alberene (acid-resistant soapstone for vats, tanks, and floors), using mason's tools: Shapes stone preparatory to setting, using chisel, hammer, and other shaping tools. Spreads mortar over stone and foundation with trowel and sets stone in place by hand or with aid of crane. Alines stone with plumbline and finishes joints between stone with pointing trowel. May spread mortar along mortar guides to insure joints of uniform thickness. May clean surface of finished wall to remove mortar, using muriatic acid and brush. May be designated according to masonry work performed as ALERENE-STONE SETTER (const.); ARTIFICIAL-STONE SETTER (const.; CURB SETTER (const.); FLAGSETTER (const.); GRANITE SETTER (const.); GUTTER-MOUTH CUTTER (const.). May set cut and dressed ornamental and structural stone in buildings and be designated STONE SETTER (const.).